

Amendments to the Claims:

Please cancel previous claims 1-22, and add claims 23-26 as follows:

23. (New) A microfluidics system for use in electrophoretic separation of charged sample components contained in a dilute sample, the system comprising:

(a) a microfluidics device having a channel network formed in a substrate, the channel network comprising a separation channel and first and second side channels that intersect the separation channel at axially spaced positions therealong, partitioning the separation channel, in an upstream to downstream direction, into:

(i) an upstream channel region, upstream of the first side channel intersection, which contains a trailing edge electrolyte and a selected concentration of a titratable species,

(ii) a sample-volume channel region, between the two side channel intersections, which contains the dilute sample, and

(iii) a downstream separation channel region, downstream of the second side channel intersection, which contains a leading edge electrolyte,

the device further comprising:

(iv) upstream and downstream reservoirs communicating with the upstream and downstream ends of said separation channel, respectively, and first and second reservoirs communicating with the first and second side channels, respectively, and

(v) upstream, downstream, first and second electrodes adapted to contact liquid contained in the upstream, downstream, first and second reservoirs, respectively; and

(b) a control unit having a power source operatively connected to each of said electrodes,

wherein the concentration of said titratable species in the trailing-edge electrolyte is selected to permit the charged sample components, upon application of a voltage potential between said upstream and downstream electrodes, to stack into a relatively small sample volume before hydroxyl or hydrogen ion migration into and through the sample-volume region is effective to overtake the charged sample components.

24. (New) The system of claim 23, wherein said upstream channel region includes a pair of upstream reservoirs, one containing the trailing-edge electrolyte, and the other containing a source of said hydroxyl or hydrogen ions.

25. (New) The system of claim 23, wherein the ratio of the length of the sample-volume channel region to that of the downstream separation channel region is between about 1:50 to 1:1.

26. (New) The system of claim 23, wherein the control unit is operable to calculate a selected concentration of titratable species in the trailing-edge electrolyte for a selected ratio of channel region lengths in said microfluidics device.